Item Position	Rationale
2	

Item Position	Rationale	
3	Option A is correct	To determine the rectangular prisms that have a volume (amount of space occupied by a

Item Position	Rationale	
6	Option B is correct	To determine

Item Position		Rationale
8	$\frac{1}{5}$, 2, $\frac{1}{10}$	To determine the equation that can be used to represent Sarah's sharing $\frac{1}{5}$ of a cake equally with her friend, the student c Ţ

$\frac{1}{5}$

Item Position	Rationale	
9	Option B is correct	To determine which graph best represents the total cost for each customer, the student should have understood that the *x*-axis (horizontal number line) represents the cost before using the coupon, and the *y*-axis (vertical number line) represents the cost after using the coupon (as shown in the axes' titles). The student should have identified the graph whose *y*-coordinates are each 5 less than the corresponding *x*-coordinates.
	Option A is incorrect	The student likely did not subtract the $5 discount and found the graph with points where the *x*-coordinates and *y*-coordinates were the same. The student needs to focus on understanding how to graph ordered pairs of numbers arising from real-world problems.
	Option C is incorrect	The student likely graphed only the $5 discount as every *y*-coordinate. The student needs to focus on understanding how to graph ordered pairs of numbers arising from real-world problems.
	Option D is incorrect	The student likely misunderstood the outcome of using a coupon and added $5 to the initial cost instead of subtracting. The student needs to focus on understanding how to graph ordered pairs of numbers arising from real-world problems.

Item Position		Rationale
12	$1\frac{5}{8}$ and any equivalent values are correct	To determine the total

Item Position	Rationale	
13	Option A is correct	To determine how many numbers in the list are composite numbers (a positive integeTJETBT/TT1 1 Tf0.003 Tc -0.003 Tw1Q.

Item Position	Rationale	
15	Option B is correct	To determine which numbers Imogen could have rounded to the nearest tenth to get 124.6, the student should have first determined that the digit in the hundredths place (second place to the right of the decimal point) will determine how the decimal will be rounded. Next, the student should have used the rules of rounding (a digit of 0, 1, 2, 3, or 4 means that the digit to the left will not change; a digit of 5, 6, 7, 8, or 9 means that the digit to the left will be increased by 1) to identify that 124.5**5** has a 5 in the hundredths place and will therefore round to 124.6.
	Option E is correct	To determine which numbers Imogen could have rounded to the nearest tenth to get 124.6, the student should have first determined that the digit in the hundredths place will determine how the decimal will be rounded. Next, the student should have used the rules of rounding to identify that 124.6**1**5 has a 1 in the hundredths place and will therefore round to 124.6.
	Option	

		round to 124.5). The student needs to focus on attending to the details of problems that compare decimal numbers rounded to the nearest tenth.

Item Position	Rationale	
16	Option D is correct	To determine the value of the expression, the student could have found the least common denominator (smallest multiple shared by the bottom numbers of all the fractions) for the fractions given. The denominators are 12, 5, and 10, and the least common multiple they have is 60. Next, the student should have multiplied both the numerator (top number in a fraction) and the denominator of each fraction by a number to get a fraction with a denominator of 60: $\frac{1}{12} \times \frac{5}{5} = \frac{5}{60}$, $\frac{1}{5} \times \frac{12}{12} = \frac{12}{60}$, and $\frac{3}{10} \times \frac{6}{6} = \frac{18}{60}$. Then, once a common denominator was obtained, the student

Item Position	Rationale	
17	Option A is correct	To determine how many slices of pie Miri has, the student should have interpreted “cut into equal slices” to mean division into equal parts. The number 3 can be written as [redacted] ator

Item Position	Rationale	
18	Option D is correct	To determine the value of the expression shown, the student should have used the order of operations (represented by acronyms such as PEMDAS or BODMAS). The student should have completed the operations in this order: (1) operations contained in Parentheses or brackets, (2) Exponents (the number of times a number is multiplied by itself), (3) Multiplication/Division from left to right, and (4) Addition/Subtraction from left to right. First, the student should have performed the operations inside the brackets. Within the brackets, the first operation to perform is the multiplication step within the parentheses: $5 \times 2 = 10$. Second, the student should have performed the division step: $20 \div 10 = 2$. Then the student should have performed the subtraction step within the brackets: $30 - 2 = 28$. Finally, the student should have multiplied by 2, resulting in 56: $2 \times 28 = 56$.
	Option A is incorrect	The student likely performed the operations inside the outer brackets from left to right without considering the parentheses. The student needs to focus on understanding how to simplify numerical expressions using the order of operations correctly.
	Option B is incorrect	The student likely performed the operations from left to right. The student needs to focus on understanding how to simplify numerical expressions using the order of operations correctly.
	Option C is incorrect	The student likely performed the operations us-1 (e

Item Position	Rationale	
19	*y*-axis, *x*-coordinate, origin	To determine which term matches each given description, the student should have understood the structure of the coordinate plane. The student should have understood that the *y*-axis is the vertical number line on the coordinate plane. The student should also have recognized that ordered pairs are written to describe first the *x*-coordinate (indicating left/right movement on the *x*-axis) and then the *y*-coordinate (indicating up/down movement on the *y*-axis). Finally, the student should have recognized that the point where the horizontal axis intersects the vertical axis is called the origin.

Item

Item Position	Rationale	
22	Option C is correct	To determine approximately how many more milliliters of water Jar Y has than Jar X, the student should have recognized that the number of milliliters of water that Jar X contains needs to be subtracted from the number of milliliters of water that Jar Y contains. In addition, the student could have recognized that since the answer is an approximation, the numbers should be rounded. The student could have rounded 705.2 mL to 700 mL and 192.6 mL to 200 mL and then subtracted: 700 – 200 = 500. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option A is incorrect	The student likely rounded 192.6 to 200 and 705.2 to 700 and then added the rounded numbers instead 7 (d)210 Tw 6.38 0 Td( )Tj-0.003 Tc 0.003 Tw

Item Position	Rationale	
23	Option A is correct	To determine the value of 1.5 × 1.12, the student could have used the distributive property to evaluate (1 × 1.12) + (0.5 × 1.12), resulting in 1.12 + 0.56 = 1.68. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option B is incorrect	The student likely multiplied the digits in the ones place together and the digits after the decimal point together and then added: (1 × 1) + (0.5 × 0.12) = 1 + 0.06 = 1.06. The student needs to focus on attending to the details of problems that involve multiplication and understanding how to solve for products of decimals to the hundredths place.
	Option C is incorrect	The student likely multiplied the digits in the ones place together and the digits after the decimal point together and then added: (1 × 1) + (0.5 × 0.12) = 1 + 0.06 = 1.06. The student then moved the decimal point one place to the right to get 10.6, confusing the steps for multiplying decimals using the distributive property with the steps of the standard algorithm (procedure). The student needs to focus on attending to the details of problems that involve multiplication and understanding how to solve for products of decimals to the hundredths place.
	Option D is incorrect	The student likely multiplied the decimals correctly using the standard algorithm (procedure), but then placed the decimal point incorrectly. The student needs to focus on understanding place value when multiplying decimals.

Item Position	Rationale
24	Option C

Item Position	Rationale	
25	÷, 12	To determine the equation that can be used to show the number of laps Trisha runs, the student should have recognized that the total number of miles Trisha ran needs to be divided by the length in miles of one lap: $3 \div \frac{1}{4}$. The number 3 can be written as a fraction with a denominator (bottom number) of 1, $\frac{3}{1}$. Then the student could have used the standard algorithm (procedure) to determine that $\frac{3}{1}$ divided by $\frac{1}{4}$ is equal to $\frac{3}{1}$ multiplied by the reciprocal (fraction with the positions of the numerator and denominator switched) of $\frac{1}{4}$: $\frac{3}{1} \times \frac{4}{1} = 12$. Last, the student should have created an equation with the division sign and the quotient (answer to a division problem): $3 \div \frac{1}{4} = 12$.

Item

Item Position	Rationale

Item Position		Rationale
28	5, 2, 10	To determine the equation that represents the expression and its product, the student should have recognized that each rectangle in the model has 5 of the 8 smaller rectangles shaded, so each rectangle represents the fraction $\frac{5}{8}$. Next, since the model has 2 identical rectangles, the

Item Position	Rationale	
29	Option B is correct	To determine the shape that belongs in Group 1 of the Venn diagram but not in Group 2, the student should have identified the shape that contains at least one pair of congruent (same size) sides but that does not contain at least one pair of parallel sides (two line segments that are always an equal distance apart and never meet). The student should have recognized that an isosceles triangle contains two congruent sides but no parallel sides. Option B is the only shape that has the characteristic described for Group 1 but not the characteristic described for Group 2.
	Option A is incorrect	The student likely identified a shape that satisfies the characteristics of both groups. A square contains at least one pair of congruent sides and at least one pair of parallel sides. The student needs to focus on attending to the details of problems that involve identifying the characteristics of polygons.
	Option C is incorrect	The student likely identified a shape that satisfies the characteristic for Group 2 but not the characteristic for Group 1. A trapezoid does not necessarily contain two congruent sides, but it does contain one pair of parallel sides. The student needs to focus on attending to the details of problems that involve identifying the characteristics of polygons.
	Option D is incorrect	The student likely identified a shape that does not belong in either group. A scalene triangle does not contain at least one pair of congruent sides, nor does it contain at least one pair of parallel sides. The student needs to focus on attending to the details of problems that involve identifying the characteristics of polygons.

Item Position	Rationale	
30	Option B is correct	To determine the number of ounces of food that Laila feeds her dog each day, the student could have used the long division algorithm (procedure) to divide the total number of ounces of food used (97.5) by the number of days (30), resulting in 3.25 ounces of food per day: 97.5 ÷ 30 = 3.25. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option A is incorrect	The student likely did not complete the division algorithm (procedure) and stopped after dividing to the tenths place. The student needs to focus on understanding how to carry out all the steps in the division algorithm with accuracy and focus on solving for quotients of decimals to the hundredths place.
	Option C is incorrect	The student likely divided 97.5 by 30 but misplaced the decimal point in the quotient (answer to a division problem). The student needs to focus on understanding how to carry out all the steps in the division algorithm (procedure) with accuracy and focus on solving for quotients of decimals to the hundredths place.
	Option D is incorrect	The student likely did not use the division algorithm correctly. The student likely divided 97 by 30, placing a 3 in the quotient. Then, after subtracting 90 from 97 in the procedure, the student likely divided 7 by 30 before bringing down the 5 from 97.5, therefore placing a zero as the second digit in the quotient. The student completed the division algorithm and then rounded 3.025 to the nearest hundredth. The student needs to focus on understanding how to carry out all the steps in the division algorithm (procedure) with accuracy and focus on solving for quotients of decimals to the hundredths

Item Position	Rationale	
31	Option D is correct	To determine which comparison is true, the student could have first added zeros as placeholders in the tenths, hundredths, and thousandths places as needed, so that the numbers would have been written as 42.500, 42.000, 42.630, and 41.172. The student should have compared the values of the digits, starting with the tens place (the digit two places to the left of the decimal point). Since all four numbers have the digit 4 in the tens place, the student should have compared the digits in the ones place next. The number 41.172 is the only number with a 1 in the ones place, and therefore is the least number in the comparison. Looking next at the tenths place (the digit to the right of the decimal point), 42.000 has a 0 in the tenths place, making it the second least number, 42.500 has a 5 in the tenths place, making it the second greatest number, and 42.630 has a 6 in the tenths place, making it the greatest number. The correct comparison is 42.63 > 42.5 > 42 > 41.172. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option A is incorrect	The student likely chose 41.172 to be the greatest number since it has the greatest number of digits. The student needs to focus on comparing and ordering decimals to the thousandths place.
	Option B is incorrect	The student likely compared the values of only the rightmost digit in each number (42.**5**, 42.6**3**, 41.17**2**, 42.**0**): 5 > 3 > 2 > 0. The student needs to focus on comparing and ordering decimals to the thousandths place.
	Option C is incorrect	The student likely read the “greater than” symbols to mean “less than.” The student needs to focus on correctly interpreting mathematical symbols.

Item Position		Rationale
32	36, 10, 12, 120	To determine which values complete the table to represent the relationship $y = 6x$, the student should have understood that the x-values should be multiplied by 6 to obtain the y-values and that the y-values should be divided by 6 to obtain the x-values. The student could have substituted (put a given number in for a variable) the two given x-values into the equation to solve for the two missing y-values: $y = 6(6) = 36$, and $y = 6(20) = 120$. The student could have divided the two given y-values by 6 to obtain the two missing x- y v e x - T h e

Item Position	Rationale	
33	Option C is correct	To determine which graph represents the values in the table, the student should have recognized that the

Item Position